

CLAIMS

1. Method to register the structural features in an acoustic conducting material, such as the sheet material of a pipe, a duct, container and the like, where instrumentation is fitted on the surface of the material whereby acoustic signals are emitted from said instrumentation and received in/through the solid material, and also that changes in the received signals as a consequence of changes in the structure of the material are registered, characterised in that

a sensor, or several sensors mutually spaced apart, is (are) arranged in contact with the surface of the material, and the sensor(s) is (are) made to emit and receive signals to provide an acoustic network with information about the structure of the material, and

that the received acoustic signals are compared with previous acoustic signals to ascertain existing structural changes in the solid material, and

any occurrences of defects in the solid material, and also the position of such defects.

2. Method according to claim 1, characterised in that the position of a defect is determined by carrying out a so-called cross-bearing, i.e. by collating distance and angle between a number of individual sensors and the defect.

3. Method according to claims 1-2, characterised in that each sensor communicates with a control unit that is formed by one of the sensors, a so-called master sensor, with the master sensor regulating the transmission and reception of acoustic signals by the sensors.

4. Method according to one of the claims 1-3, characterised in that the master sensor controls the sensors to emit and receive acoustic signals with

characteristics adapted to the measuring situation and surroundings.

5. Method according to one of the claims 1-4, characterised in that when the sensors emit and receive, respectively, acoustic signals with the same frequency, the signals are emitted with mutual time intervals.

6. Method according to one of the preceding claims, characterised in that when the sensors emit and receive acoustic signals at different frequencies, the signals are emitted simultaneously or with mutual time intervals.

7. Method according to one of the preceding claims, characterised in that the master sensor constitutes one of the sensors.

8. Method according to claim 1, characterised in that one single sensor, the master sensor, is applied and the information about the material structure is provided by registering reflections from the structure changes/defects in the sheet material.

9. Method according to claim 1, characterised in that the sensor is fitted to a pipe surface and acoustic signals are emitted/received to provide information about the structure (such as wall thickness) of the solid pipe material over a pipe cross-section.

10. System to register structural features in an acoustic conducting material, such as the sheet material of a pipe, a duct, container or the like, comprising instrumentation fitted onto the surface of the material and which is arranged to emit and receive acoustic signals in/through the solid material and also to register changes in the received signals as a consequence of changes in the structure of the material, characterised in that

the instrumentation comprises a sensor, or several sensors mutually spaced apart, in contact with the surface of the material, and the sensor(s) is(are) arranged to emit and receive signals to provide an acoustic network with information about the structure of the material, and that the received acoustic signals are compared with previous acoustic signals to show structural changes in the solid material,

any occurrences of defects in the solid material, and also the position of such defects.

11. System according to claim 10, characterised in that when one or more sensors are used, each individual sensor is arranged to communicate with a master sensor, and

that the master sensor is arranged to regulate the emission and reception, respectively, of acoustic signals by the sensors.

12. System according to one of the claims 10-11, characterised in that each individual sensor is connected to the master sensor via cables.

13. System according to claims 9-11, characterised in that the master sensor is arranged to control the time of emission of acoustic signals from each sensor, and also the used frequency characteristics.